Seismic Hazard and Micro-Risk Zonation in NCT of Delhi

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Abstract

Cities in India are going through rapid phase of population growth and urbanization and are prone to a variety of hazards and disasters, thus making vulnerability analysis and mapping a necessity for disaster mitigation and preparedness. The macro-seismic zone map of India classifies the entire country in four categories from zone V (High Intensity) to zone II (Low intensity) where zone IV and V are severe to very severe categories respectively and Delhi falling in zone IV is in the severe category. The NCT of Delhi characterized by high congestion, crowding and uncontrolled urban development with insufficient level of knowledge and awareness about seismicity risk makes NCT of Delhi a highly vulnerable to seismic hazard. *Objectives:* The present study aims to find out the spatial distribution of built-up area and population density in the districts of NCT of Delhi which are at high risk of seismicity and to identify the high risk zones at micro level in NCT of Delhi by establishing relation between various factors contributing to increasing seismic risk exposure. *Methodology:* In the present paper earthquake prone areas and status of urban expansion and development especially within highly built-up parts of NCT of Delhi is being identified with the help of existing maps and remote sensing data. The spatial association among the factors has been analyzed statistically and mapped through GIS. *Result and Discussion:* Out of 9 districts of NCT of Delhi, 4 districts lying in high seismicity risk zone going through rapid rate of urban development and urbanization in which West district is recording highest score, more than 87 %, followed by East district (82%), North east district (70 %) and Central district (60 %). Thus the study reveals that more than 50 % of the total area of the districts of NCT of Delhi is showing high risk of vulnerability due to seismicity which needs immediate attention in order to reduce the risks of seismic hazards. *Conclusions:* The spatial association between the factors increasing the risk shows the need for policy interventions and planned urban developments which are primarily required in the high risk Zonation areas.

Keywords: *Seismic risk exposure, Vulnerability analysis and mapping, Spatial association, Micro level risk zonation*